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ABSTRACT

The first of two articles in this issue of Policy Briefs focuses on the potential of modern technology to transform education in terms of what is taught, how it is taught, and how the educational enterprise is managed. Judson Hixson and Debra Beauprez center their discussion around five categories of issues that have emerged from this increased awareness of technology in education: (1) supporting change/reform efforts; (2) improving information management and student information systems; (3) changing curriculum, instruction, and the roles of both teachers and students; (4) equal access to existing and emerging technologies; and (5) changing the nature of professional development at all levels. They conclude that developing technology as a vehicle for change calls for the creation of statewide tecnnology infrastructures to facilitate and support expanded networks or "electronic highways" between and among all educational and related institutions. In his guest commentary on online rights, Jason Ohler addresses two priorities that are involved in using technology to improve education--assuring equal access for all students and realizing the impact of technology on educational change--and how they relate to the fundamental nature of schooling. (ALF)

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Technology: Its Use in Education

A National Perspective

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by Judson Hixson and Debra Beauprez, NCREL

Policy Briefs are reports on the status of current issues in education from a national perspective, descriptions of actions and agendas in the NCREL region, commentaries by experts from their particular point of view, and resources for further information.

Throughout the nation, educators, policymakers, legislators, and the general public are increasingly interested in the potential of modern technology to transform education -- in terms of what is taught, how it is taught, and how the educational enterprise is managed.

More and more schools seek new computer hardware and software as a vehicle for addressing poor academic performance, or providing enrichment options for students already performing well by traditional standards. Similarly, through new curriculum and graduation standards, policymakers and legislators are encouraging or even requiring that computer literacy, programming, and keyboard skills be included as part of the "new basic skills".

In addition, state departments of education are mandating increased requirements for high-school graduation, and some schools are responding with distance learning courses to fulfill these requirements. The broader business community also has played an active part in reminding educators that in order for our nation to remain competitive in the increasingly technological and global economy, the workforce must be a technologically literate one.

Tomorrow's adults must function effectively in a world that requires technology to develop, process, and manipulate information; to develop innovative products and services, and to increase the productivity of a shrinking workforce.

Evidence for this growing interest in technology as a means toward fundamental educational reform is found in a myriad of sources. For example, in recent years the number of journals and other periodicals, as well as professional organizations devoted to educational technology, has increased exponentially. In addition, *Education Week* lists 16 conferences on educational technology for 1989-1990.

Several important issues emerge from this increased interest and awareness in technology and its implications for education. These issues fall into five basic categories:

Supporting change/reform efforts: The questions here are basically two-fold. First, once a school, district, or state has identified new goals, priorities, and directions for school reform, how can technology be used to assist in achieving them? Second, what new models and structures for organizing schools and instruction are now possible as a result of the available technology? For example, if new graduation requirements include foreign language instruction, but sufficient teachers are not available, technology could offer the resources necessary for fulfillment of the requirements. Technology can be used in a variety of ways to make such instruction available. Alternately, telephone and computer communications capabilities can allow teachers to communicate efficiently with both parents and students, or to provide instruction for students who are unable to attend school regularly and are at risk.

Improving information management and student information systems: Though many school districts have sophisticated central student information systems, this information is seldom available to classroom teachers either in a timely manner, or in a form that can be used for instructional assessment and planning. Technology can make this data easily available to teachers in their schools or classrooms, and in a form that they can use effectively. Similarly, principals can have access to school-wide information to assist them in making decisions about allocation of human and other resources, instructional improvement priorities, or potential staff development needs.

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Changing curriculum, instruction, and the role of both teachers and students: Technology can provide relatively inexpensive access for students or teachers to a wide variety of information resources that few schools could duplicate through typical library or individual classroom resources. Access to numerous local, national, or international databases, regularly updated "electronic texts" that could be printed right in the classroom as needed, or shared video resources could expand the quantity and quality of information that can be incorporated into the instructional program. The role of teachers might also change. Teachers may become mediators of student access to information, rather than the sole dispensers of it. A far greater variety of informational resources also would be available for teachers to enhance their own learning. Teachers would be increasingly effective in monitoring student performance, progress, and problems, which would allow them to more effectively allocate their time to work with individuals or small groups of students.

Equal access to existing and emerging technologies: As increasing numbers of schools, districts, and states apply technologies to improve instruction, management, and professional development in schools, concerns regarding educational equity become more pronounced and compelling. On the one hand, technology can be an important tool for improving instruction for students who are performing poorly and who are increasingly at risk of educational failure. On the other hand, making these resources broadly available is an expensive proposition. Unfortunately, the current pattern has been that those schools and students who already have access to the most resources are also able to take advantage of new technological capabilities. Therefore, schools and students who need improvement the most have the fewest resources to support their efforts and seldom have access to the technologies and related training for staff that could make their school more effective and exciting places.

There is a very real danger that new technologies may simply exacerbate and reinforce current inequities, rather than reform or improve education as a whole. These problems are particularly acute in both small, isolated, rural schools, and large urban centers. As policymakers debate strategies for utilizing various technologies to strengthen and improve schools, priority attention must be paid to the implications of their policies for enhancing, or detracting, from educational equity in their states or districts.

Changing the nature of professional development at all levels: Perhaps the most under-utilized application of technology is professional development for teachers and administrators. Technology for professional development could be expanded, enhanced, and made more applicable for both preservice and inservice educators. Technology can provide:

- Video-based training resources for teachers and administrators
- Two-way audio and video conferencing that can provide staff development to larger groups than the current staff development methods
- Videotape libraries of exemplary instructional practices that can be used by teachers either at home or at school
- Interactive college or university courses that are offered at school sites
- Access to educational research via radio, cable, videotape, computer networking, and other vehicles

Although technology has served primarily as a tool for automating, expediting, and organizing what we already do, it has a more extensive function. Technology is a resource for expanding and creating new options for education. It can be a springboard for school restructuring by changing the roles of both teachers and students, providing equal opportunities for all, and networking currently isolated schools and school staff.

The next step—developing technology as a vehicle for change—includes the development of a capital investment strategy for computer hardware and software acquisition at both the K-12 and higher education levels, as well as new school construction/renovation standards. Another step is the formation of new strategies and priorities for preservice and inservice education. If teachers will have new roles in education, then they must be prepared for these roles.

Finally, developing technology as a vehicle for change calls for the creation of statewide technology infrastructures to facilitate and support expanded networks or "electronic highways" between and among all educational and related institutions. ■

Judson Hixson is a Program Director for NCREL. His responsibilities include the areas of professional preparation and development, educational applications of technology, and school restructuring.

Debra Beauprez is a Program Assistant at NCREL, currently working on the NCREL/PBS video series, "Restructuring to Promote Learning in America's Schools," and several internal evaluation activities.

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Regional Action & Agendas

Illinois

With the ongoing expansion in technology, educational opportunities once prohibited in rural schools because of cost and access are now being offered to students with the aid of a satellite network system called the STAR Schools Program.

The Illinois State Board of Education and Western Illinois University (WIU) are helping rural schools to receive education programs from the State Board, WIU, and other TI-IN United STAR Network affiliates via satellite.

Through the use of an interactive two-way audio, one-way video, satellite-transmitted system, the STAR Schools Program offers advanced secondary and student enrichment broadcasts. The system also provides inservice programming for educators. Courses presently available for students via the STAR Schools system include foreign languages, calculus, physics, and physical science.

The U.S. Department of Education provided funding to create the satellite network system during the 1988-89 school year. With the first year of funding, 52 sites were designated as locations for the placement of equipment to receive satellite transmission for rural school districts. Additional funding from the federal government has added 23 new downlink sites for the 1989-90 school year. Site selections for the STAR Schools Program are based on the number of Chapter 1 (educationally disadvantaged) students in rural school districts.

Legislation

To supplement the federal funds supporting the STAR Schools Program, the Illinois General Assembly appropriated approximately $500,000 during its spring session of 1989 for Western Illinois University to support the satellite system.

Future

The Illinois State Board of Education and will maintain an aggressive posture in attempting to secure both state and federal funds to bring additional programming via the established Satellite Education Network.

Indiana

Indiana has supported teacher training in technology programs with state funds since 1983. Introductory-level training has been provided to 18,300 teachers and intermediate-level training to more than 5,000. Week-long institutes have trained another 1,800 teachers. The state has supported the demonstration component since 1985.

The current focus is using technology to address identified problems in schooling and to enhance personal learning. In the context of restructuring, the state funded two summer programs, "SLICE of Tomorrow's Schools" and the "Buddy System," and is continuing to support these efforts during this school year. SLICE studies the effect of computers in the homes of students. The Buddy System provides computers for every fourth-and fifth-grade student as well as fully equipped computer labs at the schools.

An extensive research and development effort, designed to learn the most effective way to use technology in middle grades, is now in its second year.

Legislation

An appropriation of $5.4 million for the current biennium provides for statewide training, research, demonstration, and dissemination. Current successful practices are expected to influence future legislation.

Future

The State Superintendent has convened the Indiana School Technology Enterprise Council, a group of individuals representing industry, higher education, educational institutions, and museums, to assist in setting a five-year agenda for using technology to improve schools.

Iowa

High interest in the issue of technology in education is apparent in the Department of Education, the legislature, and throughout the state.

Legislation

Legislation has been passed to establish a statewide telecommunications network (1987); a long-term legislative commitment for $50 million funding over the next five years (1989); an RFP for procurement of the backbone released to vendors (December, 1989); and the development of administrative rules regarding use of telecommunications.

A requirement that each LEA have a technology plan went into effect July, 1989.

A mandate and $200,000 appropriation were passed to develop a statewide technology plan including the establishment of an electronically accessible database; the funding of pilot or demonstration projects, which encourage administrators and teachers to use electronic technology in classroom instruction and for school administrative purposes; and the establishment of one technology consultant position within the Department of Education. A second technology consultant will be hired out of separate funds to deal specifically with instructional issues.

The legislature appropriated $150,000 to establish an Educational Technology Assistance Program.

Future

The Iowa Department of Education will request $12 million in its FY91 budget for providing a technology initiative. This request was based upon the needs of today and a vision of what the ideal school should look like in the future.

Michigan

Beginning with the 1984-85 school year, the legislature appropriated a grant fund for technology initiatives in Michigan. The State Board of Education encourages the inclusion of technology utilization in the school improvement efforts at the local and regional level. It is a high priority of the State Board to increase student access to technology, especially in rural, sparsely populated areas, while improving teacher and student skills in its application. Preservice and inservice staff development activities continue on a statewide basis.

Legislation

Funding is currently available for the following grant programs which are either solely targeted for educational technology or which include educational technology as a priority area:

- Computer Literacy and Educational Technology Grants Program
- Model Two-Way Interactive Television Systems

- Computer Literacy and Educational Technology Grants Program
- Model Two-Way Interactive Television Systems
- M*STAR Telecommunications Project
- Community College Educational Telecommunications Project
- Educational Innovation Grants Program
- Section 98 Professional Staff Development Grants

Future

The Governor's 1989 State of the State Message proposed a $50 million "Classrooms of Tomorrow" initiative to double the number of computers in Michigan's classrooms. The proposed program will have a significant impact on preparing Michigan's students for the information society of the future and ensuring a technologically literate workforce. The Department of Education is currently working with an advisory committee to develop the implementation plan.

Minnesota

Technology in education is a high priority of the governor, the commissioner of education, and the legislature. The emphasis is on multiple technologies as productivity tools for learning and teaching. Minnesota is exploring uses of technology as a critical component for restructuring education.

Legislation

Current legislation provides $600,000 per year to support four courseware integration centers, statewide technology in-service activities, a large volume of software purchases, and dissemination of technology demonstration site information. Additional funds will be used for start-up funding of designated interactive television projects and planning for a statewide telecommunications network for state agencies.

Possible future technology legislation includes funding to help teachers acquire hardware for resource-based teaching, managing and tracking student progress, reporting district data electronically to the Department of Education, and providing WATTS lines for telecomputing activities.

Future

Present activities will continue at current levels. Technology tools will be developed to implement outcome-based education. Information on technology-learner outcomes will be rewritten.

Ohio

Currently technology in Ohio takes many forms. The Ohio Educational Computer Network recently has added a software program which facilitates bus routing for schools. The Management Council of the Ohio Educational Computer Network (OECN) appointed a six-person committee to determine the criteria for a library automation and networking program for the schools in Ohio. Several of the OECN "A" Site administrators are examining potential instructional uses of the networked mainframe system.

In addition, the State Board of Education charged the Department of Education with developing an educational system that would prepare students to live and work in the 21st Century, the "Information Age." The Department's response was the Classroom of the Future project. One of the key concepts of the project is the utilization of technology to track students through the curriculum and to expand human capacity by teaching for understanding.

Legislation

In November of 1979, the 113th General Assembly of the State of Ohio enacted legislation which authorized the formation of the Ohio Education Computer Network. Funding was appropriated for the purpose of providing comprehensive, cost-effective, computer-based, financial accounting services to all school districts in the State of Ohio.

Future

Distance learning programming will be available for 1990-91. Courses and teacher inservice programs will be made available through the Satellite Educational Resources Consortium (SERC), a distance learning demonstration program.

Wisconsin

Wisconsin is very active in matters regarding technology in education and is presently a member of SERC.

The Council on Instructional Telecommunications (CIT), members of which represent all K-12 interests, advises the State Superintendent and the State Educational Communications Board (ECB) and recently completed its recommendation for the use of telecommunications at the K-12 level.

Among the state initiatives currently underway are the following: 1) Each district must develop a K-12 scope and sequence computer education curriculum that is integrated into all other disciplines; 2) With more than 14 million library records (3 million of them unique), the state agency has the largest bibliographic database of library resources on compact disk (CD-ROM); 3) The state agency supports online bibliographic database searching in libraries, including school library media centers, by managing a contract providing reduced rates to in-state users and by underwriting a database search service for K-12 schools unable to do their own online searching; and 4) A State Superintendent's Task Force on School Library Media Issues is including a paper with recommendations on technology.

Legislation

Wisconsin has authorized a $1.6 million study of informational technology for the state, and the state agency will continue to request state funding to support the library bibliographic database.

Future

Anticipated next steps and future plans include the following: 1) The state has authorized $1 million to develop demonstration projects using Instructional TV Fixed Service Technology; 2) The Governor has organized an Information Technology Board using the $1.6 million study grant to develop a statewide technology plan; 3) The state agency will issue guidelines for the use of distance education in K-12 classrooms; and 4) The state will focus on staff development to enable teachers in the field to use technology effectively.

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GUEST COMMENTARY

Online Rights

By Jason Ohler, University of Alaska Southeast

Editor's Note:

Two priorities involved in using technology to improve education are: 1) assuring equal access for all students and 2) realizing the impact of technology on educational change. Our guest commentator addresses these issues and how they relate to the fundamental nature of schooling.

Imagine being present at a town meeting in a small, early American pioneer community, hearing the suggestion for the first time that along with chalk and slate tablets, students had a right to paper and pencils or even individual textbooks. Surely to some the idea must have seemed irreverent, excessive, even mad.

Educational technology policy has always been driven at least in part by what the public perceives a child's right to technology to include. The concerned parent ten years ago who questioned a school district's right to put computers in classrooms now insists his children have a right to use them on a daily basis.

Then again maybe the majority took it the way we take technology acculturation today, as inevitable. We are nearing the time when access to distance education and its most recent development, online education (using everything from two-way interactive TV to electronic mail), will cease to be experimental extras and become acceptable, inevitable educational options. Access to them will become as much a right as access to libraries and gymnasiums today.

But the ramifications of mainstreaming online education and its technologies promise to be especially profound, challenging the nature of schooling as we have known it for some time. Once designed primarily for those who could not get to school because distance or scheduling didn't allow, distance education will become a genre that attempts to provide something for just about everyone.

Parents disenchanted by the teaching quality, lack of good electives, or negative influences at the local school; cultures wanting to stress a certain heritage or value system; families trying to cultivate a more flexible life style; teachers overwhelmed by information and needing help; and students looking for education potentially less prejudicial and more global are just a few examples of those who will feel they have a right to online alternatives. We have opened the door just slightly on the online audience. When we dare open it wide we will be astounded at how diverse and vast it actually is. Technology is significant because it challenges our very concept of what a "school" is.

To appreciate this, imagine being at a school board meeting in the future, at a time when online services have become an accepted option within the overall framework of what we call schooling, an activity that might take place at home or at a newly formed neighborhood learning center run by parents, as well as at a school. Here, too, the townspeople will hear suggestions that seem irreverent, excessive, or mad. Imagine the sparks flying as school administrators, school boards, parent groups, and the NEA battle over entirely new issues, such as:

- The impact of electronic education on tenured teaching: Will electronic teachers be allowed to compete with classroom teachers?
- Balancing the budget with potentially low-cost electronic learning options: If an acceptable online or media-based option costs less than a typical classroom teacher, are we obliged to try it?
- What it means to have a teacher present in the classroom: If a certified teacher's aide "administers" a TV course, is this sufficient?
- Revising teacher certification requirements to accommodate those teachers that electronically cross service area boundaries: Whose standards will we use?
- The teacher's role amid the change: What are the strengths of face-to-face teaching within the contained classroom and how do we optimize them?

This is basically all new territory, and unlike the relatively calm debate about whether or not schools should turn to online technologies and services, all of it is emotionally charged. "School" will become a different place. And teachers, administrators, students, and community members will struggle with their new rights and responsibilities within the rapidly evolving educational community. ■

Jason Ohler is the Director of the Educational Technology Program at the University of Alaska in Juneau and the Editor of the Online Journal of Distance Education and Communication on BITNET. Ohler was keynote speaker at a professional development seminar on Distance Education held this past summer at Indiana University. His current research projects include facilitating electronic mail communication between high school students in the Soviet Union and Alaska to discuss global environmental issues, and involving Alaska middle and elementary students in the political process by linking them with and their legislators using eletronic mail.

References and Resources

Becker, H.J. (1988). The Impact of computer use on children's learning. Baltimore: Center for Research on Elementary and Middle Schools.

Bruder, I. (1988). Eighth annual survey of the states. Electronic Learning, 8, 43-50.

Goldberg, Bruce. (Ed.). Restructuring and technology: Part one. Radius 1(3) [A newsletter from the AFT Center for Restructuring.]

Goldberg, Bruce. (Ed.). Restructuring and technology: Part two. Radius 1(4) [A newsletter from the AFT Center for Restructuring.]

Mechlenberger, J.A. (1988). What the ostrich sees: Technology and the mission of American education. Phi Delta Kappan, 70, 18-19.

National School Boards Association (1989). The electronic school (Special Supplement). The American School Board Journal, 176, A1-A32.

Norris, William C. (1987, November 18). Computer-based education: A "key" to reform. Education Week, 28.

Pearlman, R. (1989). Technology's role in restructuring schools. Electronic Learning, 8, 8-12, 14, 15, 56.

Perlman, J. (1988). Restructuring the system is the solution. Phi Delta Kappan, 70, 20-24.

Pipho, C. (1989, February 22). Planning for technology. Education Week, 26.

Roberts, J.L. (Ed.). (1989) Schools Inc. (Special Supplement). Electronic Learning. New York: Scholastic, Inc.

U.S. Congress, Office of Technology Assessment (1988). Power on! New tools for teaching and learning. (OTA-SET-379). Washington, DC: U.S. Government Printing Office.

U.S. Congress, Office of Technology Assessment (1989). Linking for learning: A new course for education (OTA-SET-430) Washington, DC: U.S. Government Printing Office.

West, P. (1990, February 14). Proposals to launch educational satellite gain favor. Education Week, pp. 1, 21.

ILLINOIS

Illinois Satellite Education Network has uplink capabilities, a program development capacity, and 85 rural downlink sites.

Illinois State Board of Education
Suite 214
Mt. Vernon, IL. 62864
Richard Haney: 618/242-1676
Sharon K. Roberts: 618/242-1676

IOWA

Iowa Dept. of Education Staff:
Leland Tack, Administrator, Div. of Planning & Accountability

Gail Sullivan, Administrative Policy Consultant

Administrative Support Staff:
Susan Donielson, Administrator, Div. of Instructional Services

Ted Stilwill, Administrator, Division of Professional & Administrative Support

Iowa Dept. of Education
Division of Planning and Accountability
Grimes State Office Building
Des Moines, Iowa 50319
Leland Tack, Administrator
515/281-4835

INDIANA

Indiana State Dept. of Education
Room 229, State House
Indianapolis, Indiana 46204-2798
Carol D'Amico: 317/232-3513
Phyllis Land Usher: 317/232-9101

MICHIGAN

Michigan Dept. of Education
P.O. Box 30008
Lansing, Michigan 48909
Dorothy VanLooy
517/373-1830

MINNESOTA

Videotapes:
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Interactive Television Teaching
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Online for Information

Minnesota Dept. of Education
Media and Technology Unit
682 Capitol Square Building
550 Cedar Street
St. Paul, Minnesota 55101
Joan Wallin
612/296-1570

OHIO

Ohio State Dept. of Education
65 S. Front Street
Columbus, Ohio 43215
Margaret Trent
614/466-4838

WISCONSIN

Professional staff are available for technology utilization from the ECB and DPI.
Two legislated grants including $1.6 million for the development of a statewide plan and $1 million for demonstration projects are available.
In addition to the grants, the ECB is constructing and maintaining technology initiatives.

Wisconsin Department of Public Instruction
P.O. Box 7841
Madison, WI 53707
Lyle C. Martens
608/266-3361

Opinions expressed in the commentaries do not necessarily reflect the views of the NCREL staff or Board. Facts and ideas presented in NCREL's Policy Briefs are intended to survey a current issue and not to advocate a particular position.

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A publication of the North Central Regional Educational Laboratory
295 Emroy Avenue
Elmhurst, Illinois 60126

Telephone: (708) 941-7677
FAX: (708) 941-7163
GTE: ncrel.lab

Jeri Nowakowski, *Executive Director*
Nancy Fulford, *Editor*
Marianne Kroeger, *Production Editor*
Julie Casiello, *Desktop Publishing Coordinator*

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